CLAIMS

What is claimed is:

1. A method for the production of malate conjugated aromatic acids comprising: contacting a glycosylated aromatic acid with malate in the presence of an effective amount of sinapoylglucose:malate sinapoyltransferase which catalyzes the substitution of a glucose moiety on the glycosylated aromatic acid with a malate moiety to form a malate conjugated aromatic acid.

2. A method for the production of carboxylic acid conjugated aromatic acids comprising: contacting a glycosylated aromatic acid with an α-hydroxycarboxylic acid of the general formula:

R-COOH, where R is C_1 to C_{20} substituted or unsubstituted alkyl or substituted or unsubstituted alkenyl or substituted or unsubstituted alkylidene;

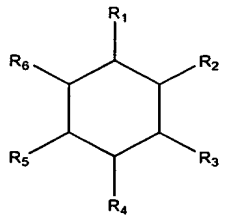
and an effective amount of sinapoylglucose:malate sinapoyltransferase which catalyzes the substitution of a glucose moiety on the glycosylated aromatic acid with the α-hydroxycarboxylic acid to form a carboxylic acid conjugated conjugated aromatic acid.

3. A method for the production of aromatic esters comprising: contacting a glycosylated aromatic acid with an alcohol of the general formula:

R-OH, where R is C_1 to C_{20} substituted or unsubstituted alkyl or substituted or unsubstituted alkenyl or substituted or unsubstituted alkylidene;

and an effective amount of sinapoylglucose:malate sinapoyltransferase to form an aromatic ester.

4. A method according to any one of Claims 1, 2 or 3 wherein the aromatic acid is described by the formula:



wherein

R_1 - R_6 are each independently H, or OH, or COOH or OR_7 or R_7COOH; and

R_7 is C_1 to C_{20} substituted or unsubstituted alkyl or substituted or unsubstituted alkenyl or substituted or unsubstituted alkylidene;

providing at least one of R_1 - R_6 is COOH.

5. A method according to Claim 1 wherein the aromatic acid is *para*-hydroxybenzoic acid.

6. A method according to Claim 2 wherein the α-hydroxycarboxylic acid is lactate.

7. A method according to Claim 3 wherein the alcohol is selected from the group consisting of methanol, ethanol and isopropanol.

8. A method for the production of pHBA malate comprising:

a) providing a host cell producing suitable levels of glycosylated pHBA;

b) introducing into the host cell a nucleic acid molecule encoding sinapoylglucose:malate sinapoyltransferase,

wherein the sinapoylglucose:malate sinapoyltransferase catalyzes the substitution of a glucose moiety on the glycosylated pHBA with a malate moiety to form pHBA malate; and

c) optionally recovering the pHBA malate.

9. A method for the production of pHBA comprising:

a) providing a host cell producing suitable levels of glycosylated pHBA;

b) introducing into the host cell a nucleic acid molecule encoding sinapoylglucose:malate sinapoyltransferase,

wherein the sinapoylglucose:malate sinapoyltransferase catalyzes the substitution of a glucose moiety on the glycosylated pHBA with a malate moiety to form pHBA malate;

c) recovering the pHBA malate; and

d) processing the pHBA malate of step (c) to recover pure pHBA.

10. A method according to any one of Claims 8 or 9 wherein the host cell is selected from the group consisting of bacteria, filamentous fungi and plants.

11. A method according to Claim 10 wherein the host cell is selected from the group consisting of *Aspergillus*, *Trichoderma, Saccharomyces*, *Pichia*, *Candida*, *Hansenula*, *Salmonella, Bacillus*, *Acinetobacter, Rhodococcus, Streptomyces*, *Escherichia* and *Pseudomonas*.

12. A method according to Claim 10 wherein the host cell is selected from the group consisting of soybean, rapeseed, sunflower, cotton , corn, tobacco, alfalfa, wheat, barley, oats, sorghum, rice, *Arabidopsis,* cruciferous vegetables, melons, carrots, celery, parsley, tomatoes, potatoes, strawberries, peanuts, grapes,

grass seed crops, sugar beets, sugar cane, beans, peas, rye, flax, hardwood trees, softwood trees and forage grasses.

13. A method according to Claim 11 wherein the nucleic acid molecule encoding sinapoylglucose:malate sinapoyltransferase, is selected from the group consisting of:

(a) an isolated nucleic acid molecule encoding the amino acid sequence as set forth in SEQ ID NO:7;

(b) an isolated nucleic acid molecule encoding a polypeptide having at least 90% identity with the amino acid sequence selected from the group consisting of SEQ ID NO:7;

(c) an isolated nucleic acid molecule that hybridizes with (a) under the following hybridization conditions: 5X SSC, 0.1% SDS, 0.25% milk and washed with 2X SSC, 0.1% SDS followed by 0.1X SSC, 0.1% SDS; and

(d) an isolated nucleic acid molecule that is complementary to (a), (b), of (c).

14. A method according to Claim 12 wherein the nucleic acid molecule encoding sinapoylglucose:malate sinapoyltransferase is selected from the group consisting of:

(a) an isolated nucleic acid molecule encoding the amino acid sequence as set forth in SEQ ID NO:1;

(b) an isolated nucleic acid molecule encoding a polypeptide having at least 90% identity with the amino acid sequence selected from the group consisting of SEQ ID NO:1;

(c) an isolated nucleic acid molecule that hybridizes with (a) under the following hybridization conditions: 5X SSC, 0.1% SDS, 0.25% milk and washed with 2X SSC, 0.1% SDS followed by 0.1X SSC, 0.1% SDS; and

(d) an isolated nucleic acid molecule that is complementary to (a), (b), of (c).